

CHAMP

USU CONSORTIUM
FOR HEALTH AND
MILITARY PERFORMANCE



Sustaining Health for the Long Term Warrior

Deuster/Kemmer/Tubbs/Zeno

Overview

- **Principles of good eating**
- **Omega-3 Fatty Acids**
- **Bone Health**
- **Phytonutrients**
- **Dietary Fiber**
- **Pre- and Pro-Biotics**



7.4.2001



Principles of Good Eating



- **Variety**
- **Balance**
- **Moderation**
 - **Planning in advance is important**
- **General rule**
 - **90% of foods should be healthy**
 - **Limit junk foods to $\leq 10\%$ of the diet**



CHAMP Mediterranean Diet



- **High in fresh fruits, vegetables, bread, grains, potatoes, beans, nuts and seeds**
- **Weekly intake of eggs: 0 to 4**
- **Minimal intake of red meat**
- **Low to moderate intake of dairy products, fish, and poultry**
- **Frequent and regular use of olive oil**
- **Low to moderate intake of wine**
- **High in omega-3 fatty acids**



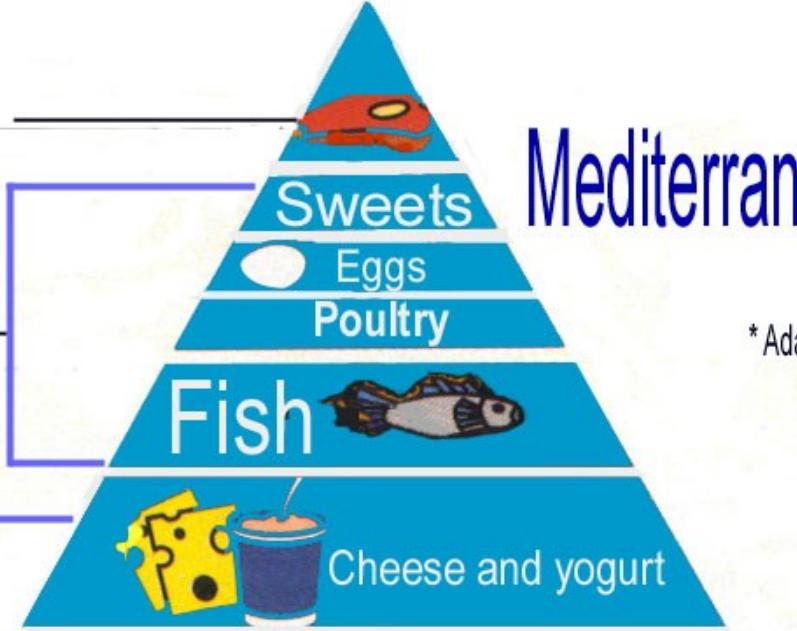
Mediterranean Diet Pyramid*

* Adapted from Consumer Reports, Nov'94

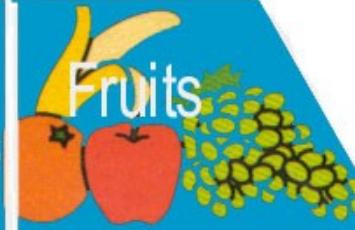
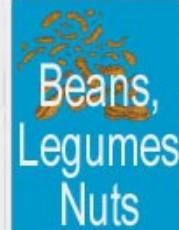
Red meat - a few times per month in very small amounts

A few times per week

Daily



Olive Oil



Bread, pasta, rice, couscous, polenta, bulgar, other grains, and potatoes



Omega-3 Fatty Acids



- **Polyunsaturated fatty acids (PUFA)**
 - **Alpha (α)-linolenic acid (ALA)** - plant-derived
 - **Eicosapentaenoic acid (EPA)** - marine-derived
 - **Docosahexaenoic acid (DHA)** - marine-derived
- **ALA - required in diet, because cannot be synthesized**
- **DHA and EPA can be synthesized from ALA**



ALA Content of Plants



Vegetable/Nuts/Seeds (3 oz)	ALA (mg)	Total Fat (g)
Brazil Nuts	30	56.5
Flaxseeds	19,400	35.8
Soybeans, green, boiled	301	5.4
Spinach, raw	56	0.13
Sunflower seeds, dry roasted	59	42.3
Tofu	495	7.4
Walnuts, English	7,700	55.5

EPA and DHA
Content of Fish

Fish (3 oz)	EPA (mg)	DHA (mg)	Fish (3 oz)	EPA (mg)	DHA (mg)
Bass, Striped	184	637	Oysters (~6)	228	248
Catfish	42	109	Salmon (Atlantic)		587
Clams (9)	117	124	1,238		
Flounder	207	219	Salmon (Coho)	347	740
Haddock	65	138	Sardines	520	845
Halibut	77	318	Swordfish	111	579
Herring	825	1,003	Trout, Rainbow	284	697
Mackerel	555	1,016	Tuna, Bluefin	309	910
			Tuna, White	198	535



Omega-3 and Requirements



- **Recommended intake for EPA and DHA \geq 650 mg/day or 0.3% of total calories**
- **Recommended intake for ALA is 1.6 g/day**
- **Typical diets today are high in saturated and trans, and low in omega-3 fatty acids**
- **Ratio of omega-6 to omega-3:**
 - Currently ranges from 14:1 to about 20:1
 - Recommended ration is 5:1



Omega-3 and Health



Adequate dietary intake may reduce risk of:

- Heart disease
- Stroke
- Cancer
- Diabetes

May be useful for treating:

- Inflammatory conditions
- Auto-immune diseases,
- Negative mood and depression





Bone Health



- **Concern in SOF training because of stress fractures**
- **Peak bone mass during adolescents and early life achieved through proper diet and physical activity**
- **Need adequate intake of calcium, vitamin D and other essential minerals**
- **Recommended calcium intake is 1000 mg/day**
 - **Averages intakes range from 500 to 700 mg**



Reasons for Decline in Calcium Intake



- **Sodas/colas have replaced milk**
 - Contain phosphoric acid & caffeine, which inhibit calcium absorption
- **Regular consumption of > 3 Alcoholic Beverages/day**
- **Acidic diet**
- **Smoking/Use of Tobacco**
- **Excessive intakes of Vitamin A**





Phytonutrients



- **Chemicals in plants that protect against bacteria, viruses, and fungi**
- **May decrease risk of developing certain cancers, diabetes, hypertension, and heart disease**
- **Act as anti-inflammatory agents, antioxidants, and/or other nutrient protectors**
- **Should be derived from real foods, NOT dietary supplements**



Phytonutrient Food Sources



Allicin	Onions, garlic
Anthocyanins	Red and blue fruits and vegetables
Bioflavonoids	Citrus fruits
Carotenoids	Dark yellow, orange, and deep green fruits and vegetables
Flavonoids	Fruits, vegetables, wine, green tea, onions, apples, kale, and beans
Indoles	Bok choy, cabbage, kale, brussel sprouts, and turnips
Isoflavones	Soybeans and soy products
Lignins	Flaxseed & whole grain products
Lutein	Leafy green vegetables
Lycopene	Tomato products



Dietary Fiber



- **Structural carbohydrate of plants**
- **Neither digested nor absorbed**
- **Insoluble fibers - Predominant**
 - **Absorbs water in gastrointestinal tract**
 - **Promotes regular elimination**
 - **Increases stool weight**
 - **Speeds up digestion/elimination time**
- **Soluble fibers - Health benefits**
 - **Lowers serum cholesterol**
 - **Regulates blood sugar levels**





Intake of Dietary Fiber



- **Increased fiber intake may reduce risk of:**
 - **Gastrointestinal diseases**
 - **Hypertension**
 - **Diabetes**
 - **Heart disease**
 - **Several types of cancer (Colon)**
- **Recommended: 20-35 g daily**
- **Best sources: fruit, vegetables, whole breads/cereals, beans, rice, nuts, seeds**
- **Adequate water intake is important**



Legumes:
15-19
g/cup



Wheat bran
(17 g/cup)



Probiotics

- **Live microorganisms**
- **Help maintain natural balance in intestines**
- **Promote a healthy digestive system**
- **> 400 types of “good bacteria” residing in digestive tract that reduce the effects of harmful bacteria**
- **Sources: Yogurt, keifer, cultured milk products, sauerkraut, tempeh, miso**



Health Benefits of Probiotics



- **Prevent colon cancer**
- ☒ **↓ LDL “Bad” Cholesterol**
- ☒ **↓ blood pressure**
- **Improve immune function & prevent infections**
- **Improve mineral absorption**
- **Prevent harmful bacterial growth under stress**

Manage Lactose Intolerance

Shorten Duration of Intestinal Infections

Potential Benefits of Probiotics

Treat Diarrhea

Improve Symptoms of Irritable Bowel Syndrome

Reduce Bladder and Urinary Tract Infections



Probiotics



- **Fuels used by bacteria in digestive tract**
- **Non-digestible carbohydrates that stimulate growth of beneficial probiotics**
- **Naturally occur in plants, such as garlic, asparagus, and onion**
- **Other sources: oatmeal, barley, beans, whole grains, leafy green vegetables, berries, yogurt, and milk**



An Alkaline Diet



- **Acids, by-products of metabolism, disposed of through urine & sweat**
- **High alkaline diets recommended during significant physical & mental stress to remove excess acids**
- **Best to balance acid & alkaline foods;**
- **Normal pH levels**
 - **Urine: (4.5-8) based on foods eaten during day**
 - **Blood: (7.41) slightly alkaline**

Most Alkaline	More Alkaline	Low Alkaline	Lowest Alkaline	Food Category	Lowest Acid	Low Acid	More Acid	Most Acid
Baking Soda	Spices/Cinnamon Vanilla Licorice Black Cohosh Agave	*Herbs(most):Anise, Bergamot,Echinacea Chrysanthemum, Ephedra,Feverfew, Goldenseal,Lemongrass Aloe Vera Nettle Angelica	White Willow Bark Slippery Elm Artemesia Annua	Spice/Herb	Cayenne	Vanilla Stevia	Nutmeg	Pudding/Jam/Jelly
Sea Salt Mineral Water	*Kombucha	*Green or Mu Tea	Sulfite Ginger Tea	Preservative Beverage	MSG Kona Coffee	Benzene Alcohol Black Tea	Aspartane Coffee	Table Salt/NaCl Beer 'Soda' Yeast/Hops/Malt Sugar/Cocoa
	Molasses Soy Sauce	Rice Syrup Apple Cider/Vinegar	*Sucanat *Umeshu/Vinegar	Sweetner Vinegar	Honey/Maple Syrup Rice Vinegar	Balsamic Vinegar	Saccharin Red Wine Vinegar	White/Acetic Vinegar Antibiotics
*Umeboshi Plum		*Sake	*Algae,Blue Green	Therapeutic		Antihistamines	Psychotropics	Processed Cheese
			*Ghee (Clarified Butter)	Processed Dairy	Cream/Butter	Cow Milk	*Cassis,Milk	Ice Cream
			Human Breast Milk	Cow/Human Soy Goat/Sheep	Yogurt	Aged Cheese SoyCheese GoatMilk	New Cheese SoyMilk	
				Goat/Sheep Cheese				
		*Quail Egg	*Duck Egg	Egg	Chicken Egg			
				Meat Game	Gelatin/Organs	Lamb/Mutton	Pork/Veal	Beef
				Fish/Shell Fish	*Venison Fish	Box/Eel/Game Meat Shell Fish/Mollusks	Beef Mussel/Squid	*Lobster
				Fowl	Wild Duck	Goose/Turkey	Chicken	Pheasant
			Oat 'Gmo Coffee'	Grain Cereal Grass	*Triticale Millet Kasha *Amaranth Brown Rice	Buckwheat Wheat *Soy/Teff/Kamut Farina/Semolina White Rice	Maize Barley/Great Corn Rye Oat Bran	Barley Processed Flour
Pumpkin Seed	Pumpkin Seed Cashew Chestnut Pepper	Primrose Oil Sesame Seed Cod Liver Oil Almond *Sprout	Avocado Oil Seeds(most) Coconut Oil Olive/Macadamia Oil Linseed/Flax Oil	Nut Seed/Sprout Oil	Pumpkin Seed Oil Grape Seed Oil Sunflower Oil Pine Nut Canola Oil	Almond Oil Sesame Oil Safflower Oil Tapioca *Soybean or Tofu	Pistachio Seed Chestnut Oil Lard Pecan Palm Kernel Oil	*Cottonseed Oil/Meal Hazelnut Walnut Brazil Nut Fried Food
Hydrogenated Oil								
Lentil Broccoli *Seaweed Nori/Kombu/Wakame/Hijiki Onion/Miso *Daikon/Taro Root *Sea Vegetables(other) Dandelion Greens *Burdock/Lotus Root Sweet Potato/Yam	Kohlrabi Pumpkin/Taro Gedic Asparagus Kale/Parsley Endive/Anguria Mustard Greens Jerusalem Artichoke Ginger Root Broccoli	Potato/Bell Pepper Mushroom/Fungi Cauliflower Cabbage Rutabaga *Salsify/Ginseng Eggplant Pumpkin Collard Greens	Brussel Sprout Beet Chive/Cilantro Celery/Scallion Okra/Cucumber Turnip Greens Squash Root Lettuce Jicama	Bean Vegetable Legume Pulse Root	Spinach Fava Bean Kidney Bean Black-eyed Pea String/Wax Bean Zucchini Chutney Rhubarb	Split Pea Pinto Bean White Bean Navy/Red Bean Aduki Bean Lima or Mung Bean Chard	Green Pea Peanut Snow Pea Lentils Cannellini Chick Pea/Garbanzo	Soybean Cannab
Lime Nectarine Peach/Persimmon Raspberry Watermelon Tangerine Pineapple	Grapefruit Cantaloupe Honeydew Citrus Olive *Gooseberry Loganberry Mango	Lemon Pear Avocado Apple Blackberry Cherry Peach Papaya	Orange Apricot Banana Blueberry Pineapple/Juice Raisin/Cumquat Grape Strawberry	Citrus/Fruit	Coconut Guava *Pickled/Fruit Dry/Fruit Fig Peach/Persimmon/Juice *Cherimoya Date	Plum Prune Tomato	Cranberry Pomegranate	



Key Points



- **Eating a variety of foods is key to healthy living**
- **A Mediterranean Diet may be beneficial**
- **Healthy bones require adequate calcium and regular physical activity**
- **Consume at least 3 - 5 servings of colorful vegetables, ≥ 2 of fruit, ≥ 6 of whole grain foods**
- **Probiotics may promote a healthy digestive tract**
- **Alkaline-, rather than acid-forming, foods are important during periods of high stress**